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WILDLIFE REVIEW

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Chicago, Ill. No. 46 July, 1946

Conservation: Geese

Day, Albert M. Goose business, Outdoorsman (814 North Tower Court, Chicago 11, Ill. 20 cents a copy), 88(3), May-June 1946, pp. 20-21, 57-58, 2 photos (one a portrait of the author).

The history of the goose concentration at Horseshoe Lake, Illinois, and its exploitation to a point where prohibition of shooting became necessary to save the birds. The breeding area of this flock of geese has been learned by tracing the movements of banded birds and field investigation there revealed that Indians were taking a heavy toll. Careful management of this segment of the continental goose population thus is a necessity. The numbers of the birds at certain other wintering areas in the United States are estimated; a much lower rate of kill makes it possible to continue hunting in several important winter ranges..

Conservation: History in Maryland

[LeCompte, E. Lee]. History of natural resources, Annual Report, Game and Inland Fish Commission of Maryland (512 Munsey Bldg., Baltimore 2), 1945, pp. 9-17.

General remarks on wildlife and on the value of outdoor sports; history of conservation in Maryland; development of the Commission's work; Pittman-Robertson program.

Conservation: Iowa Wildlife

Hendrickson, George O. "Birds and mammals", in Report of the Conservation Committee of the Iowa Academy of Science. Reprinted from Proc. Iowa Acad. Sci. 51, 1944 (Iowa Conservation Commission, Des Moines), pp. 49-57, 3 tables, 1946.

Sketch of wildlife conservation system in Iowa. Significant statement: "The Commission is ordered by statute to make surveys and to conduct research in order to obtain factual evidence upon which to base its actions and regulations." The work of the Iowa Cooperative Wildlife Research Unit, which aids the Commission, is summarized. Publications of the Unit and of the Commission are noted, as are field activities of both, and cooperation of the public. A limited restocking policy is defined but the wildlife management program of the Commission emphasizes maintenance of cover, which is likely to be deficient in Iowa, 90 percent of the area of which is tillable. State refuges and game management areas are enumerated. The avifauna of the State and its protection are reviewed, with special reference to game birds. Estimated takes in 1942 and 1943 are tabulated. Environmental conditions and management procedures are briefly described. Similar information about mammals is presented, including the estimated head of small game taken in the 1942-43 and 1943-44 seasons and the numbers and value of furs of 12 species harvested in 1943-44 (total value $2,961,462). Control of injurious mammals is considered and the role of predation in the State is summarized.

Conservation: Waterfowl

Day, Albert M. The problem of increased hunting pressure on waterfowl, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 17(1), April 1946, pp. 4-5, 26, 29, 4 photos.

The number of hunters is increasing but that of waterfowl has been declining (1944, 1945). The bag has been greater than the annual increase and protective regulations should be so modified as to lessen hunting pressure upon the birds. Steps taken to restore environment are reviewed; those in the breeding range are fairly adequate, but much remains to be done in wintering areas. Unwarranted claims of achievement by Ducks Unlimited are discussed. Authentic publicity is required to inform the public of the status and needs of the waterfowl.

Control: Aquatic weeds

Black, John D. Nature's own weed killer--the German carp, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison 2), 11(4), April 1946, pp. 3-7, 7 photos.

The destruction of water plants by carp has usually been considered injurious to man's interests but in fish culture ponds, the fish can be used to keep down undesirable growths. Experimental results are described and illustrated.

Control: Bounties

Douglass, Donald M., and A. M. Stebler. Bounties don't work out as they are supposed to, Michigan Conservation (Dept. of Conservation, State Office Bldg., Lansing 13, Mich.), 15(2), Feb. 1946, pp. 6-7, 10, 2 tables.

Coincidence of fox abundance with lowered grouse and pheasant populations has resulted in suggestions that a bounty be paid on foxes. However, the Department of Conservation does not believe that a bounty would bring about appreciable reduction in number of the foxes. A substantial bounty on coyotes has been in effect for 10 years but these animals are more numerous than ever. Bounties on wolves were in effect in Michigan as early as 1838, and have been tried for various other animals and birds. All were attended by fraud. A State hunter system of control was substituted in the period 1921-1934. A good many animals other than those being combatted were killed and under sportsman pressure, the paid-hunter method was abandoned. Bounties on wolves, coyotes, and bobcats were resumed; a table of the numbers and costs involved, 1936-1945, is presented. "There is every reason to believe, from the way the numbers of the animals hold up, that the present high rate of 'take' is no more than the annual surplus. The concept of a surplus that the hunter can harvest is familiar enough as regards game species, and undoubtedly applies to predatory species as well. Although it is generally assumed that trapping for bounty holds our wolf and coyote populations in check, it is actually reasonable to believe that there would be few if any more of them without any trapping whatever. The suggestion appears absurd, but is in line with experience with both game and predatory species. Unless control removes more animals than would

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normally die as a result of natural causes, it has no effect. All species of animals are subject to natural checks on their unlimited increase, with the result that their numbers tend to be fairly stable. Predators are no exception to the rule." Relating certain fraudulent or undesirable incidents of the bounty system, the authors conclude: "it is clear that the bounty system tends to beget dishonesty that defeats the purpose of the system. A low bounty is only a minor incentive for a man to hunt or trap unless he does it for sport or to get rid of an animal that is causing him direct loss. Such low bounties usually are paid for animals that would be taken anyway. A bounty high enough to make trapping or hunting really profitable invites the swindler to do his worst."

Control: Calculating poison bait mixtures

Storer, Tracy I. Calculating poison bait mixtures, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 177-180, 2 figs.

Nomogram for converting bait formulas stated in different systems of measurement, and for saving calculation in finding the proper quantities of certain items when others are known. A second nomogram, of value in experimentation, provides a means of finding the lethal doses of various poison mixtures for animals of different weights.

Control: Coyote

Alcorn, J. R. On the decoying of coyotes, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 122-126, 1 fig.

By imitation of its call, some by voice, some by aid of wind instruments which are described, one being illustrated. Log of use, including notes on the food of animals taken.

Control: Crow

Hanson, H. Gordon. Crow center of the United States, Oklahoma Game and Fish News (State Game and Fish Commission, Oklahoma City 5, Okla.), 2(3), March 1946, pp. 4-7, 18, 1 pl., 4 figs.

Description of bombs employed in blasting crow roosts and the manner of their use. In eleven seasons, 1934-1945, the bombings have killed about 3-3/4 million crows. Location of the major roosts is noted and mapped. Some bombing by Oklahoma crews has been done in Texas and Kansas at the expense of those States. Three publications of the Fish and Wildlife Service on economics of the crow in the region are cited and abstracted. The cost of the work is not recorded.

Control: Lethal doses of rodenticides

Dieke, Sally H., and Curt P. Richter. Comparative assays of rodenticides on wild Norway rats, Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 61(19), May 10, 1946, pp. 672-679, 2 figs.

The poisons are listed, the method of administration described and illustrated, and the results tabulated and summarized. Sodium fluoracetate (1080) had by far the lowest, and barium carbonate the highest, median lethal doses. Bibliography of 7 titles.

Control: Rat

Richter, Curt P. The development and use of alpha-naphthyl thiourea (ANTU) as a rat poison, Journ. American Medical Assoc. (535 No. Dearborn St., Chicago 10, Ill. 25 cents a copy), 129(14), Dec. 1, 1945, pp. 927-931.

Report upon laboratory investigation and field trials. From author's summary: "A new rat poison, alpha-naphthyl thiourea (abbreviated ANTU) has been discovered which compares very favorably with other rodenticides at present available as to cost, toxicity, and voluntary acceptance by rats. It is a relatively specific poison for Norway rats, being less toxic to all other species tested. Its emetic property protects dogs in most cases. No human fatalities or toxic symptoms in human beings have been observed during three years of extensive use in a city."

Control: Rat

Richter, Curt P., and John T. Emlen, Jr. Instructions for using ANTU as a poison for the common Norway rat, Public Health Reports (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 61(17), April 26, 1946, pp. 602-607.

This poison (alpha-naphthyl thiourea) has been used extensively in a city anti-rat campaign, giving a 90 percent or larger degree of control and causing no cases of human poisoning. ANTU is highly specific for the Norway rat and is not recommended for killing other city-infesting rodents. "It does not poison chickens, pigeons, rabbits, guinea pigs, or squirrels. It can kill dogs and cats, but it does so infrequently since in most instances the animals vomit before the poison is absorbed.". The properties of the substance are discussed and directions for its use explicitly stated. Suggestions are given as to the treatment of accidental poisoning of humans or pets.

Cycles: Snowy owl invasions

Gross, Alfred O. Snowy owl invasions, Bul. Massachusetts Audubon Soc. (155 Newbury St., Boston 16, Mass. 20 cents a copy), 30(2), March 1946, pp. 29-32, 1 fig.

These irruptions occur once in four years, on the average, thus are definitely cyclic. They follow cycles of the same length in lemming populations and with knowledge of the status of these rodents, are predictable. The interrelations of arctic rodent populations and their predators are discussed and plans for the study of the present snowy owl invasion are set forth. Few of the birds live to return to the north. Bibliography of 7 titles.

Destruction: By DDT

Cottam, Clarence, and Elmer Higgins. DDT: Its effect on fish and wildlife. Fish and Wildlife Service, U. S. Dept. of the Interior, Circular 11 (Supt. of Documents, Washington 25, D. C. 5 cents a copy), 14 pp. 1946.

Summary of cooperative work, the agencies concerned being mentioned in the introduction and 16 individuals performing field and laboratory investigations named in footnotes. The studies are reported upon by localities where made, and the results in most cases are segregated for the various vertebrate phyla. Recommendations are made for minimizing danger to wildlife. Fourteen titles of published literature are cited. Authors' summary: "Field observations on the damage to fish and wildlife caused by DDT used in insect control were made in 12 States and the Province of Ontario. Fair to successful insect control was effected. The principal investigations were made on forest lands in Maryland treated experimentally to determine the effects of DDT on vertebrates and invertebrates, and in Pennsylvania where gypsy moth larvae were the objects of control. Application of DDT was made chiefly as an oil spray by airplane. Spray concentrations ranged from one-fifth pound to 5 pounds per acre. The greatest quantity used anywhere was an application to the ground of dry DDT at the rate of 25 pounds per acre. The amount of DDT that actually reached the vegetation showed considerable local variation from the specified rate of application, owing to bad weather, lack of landmarks, defective spray apparatus, and difference in density of vegetation. Pronounced mortality in wildlife resulted from the use of most of the higher concentrations of DDT. Mortality was slight or not apparent in most of the lower dosages, those sufficient effectively to control the insect pest concerned. Invertebrates, fishes, and other cold-blooded vertebrates were more readily affected than were birds and mammals. In the single trial made, DDT was much more toxic to fish when applied in emulsion than when applied in oil or in suspension. In laboratory experiments, cottontail rabbits were not affected by single doses of crystalline DDT at levels less than 1,500 milligrams per kilogram of body weight. For quail, no effect was produced below the 200 milligram level. The DDT was more toxic when dissolved in oil. Fish were usually killed by single doses of DDT as low as 5 milligrams per kilogram of body weight, especially if dissolved in oil. In oils of low-melting point the toxicity was increased. No effect was obtained by feeding to bluegill sunfish flies sprayed with DDT in oil at the rate of 1 pound per acre. Controlled spraying of an entire habitat, including food, at the rate of 5 pounds of DDT per acre had no effect on field mice."

About the same material, though in somewhat briefer form, appears in the Journal of Economic Entomology, 39(1), Feb. 1946, pp. 44-52 (E. N. Cory, College Park, Md. 75 cents a copy).

Destruction: By DDT

Couch, Leo K. DDT investigations in relation to wildlife and fish, Application of DDT by Airplane for Mosquito Control at Savanna Ordnance Depot Proving Grounds, Ill. (Army Service Forces, Headquarters Sixth Service Command, Chicago, Ill.), 14 pp., 1946.

Appendix to a report that describes the spraying operations and their effect upon mosquitoes and other insects. (This has photos, tables, and maps) Couch briefs the history and methods of the project, describes his own inspections, and gives conclusions of other observers and himself as to the effects of the operations upon insects, vertebrates, mussels, and crayfishes. Little harm appeared to have resulted to fish and land vertebrates, but suggestions are made of additional safeguards to be adopted in future campaigns.

Destruction: By DDT

Terres, John K. Dynamite in DDT, New Republic (40 East 49th St., New York 17, N. Y. 15 cents a copy), 114(12), March 25, 1946, pp. 415-416.

Popular review of the results of experiments with this new insecticide in Pennsylvania and Maryland. At five pounds to the acre, nearly all wildlife, including birds, was killed; at a one-pound rate, insects but not birds were destroyed. Even so, there may be secondary bad effects upon birds through elimination of many of their food organisms. "The federal government has 14 experimental areas in the United States where the effect of DDT is being observed on plants and soil, and on insects, birds, fishes and other creatures important as food or in keeping harmful insects within bounds. It seems advisable not to use DDT outside of buildings until the results of those experiments are better known. DDT must be reduced to a much finer selectivity if it is to spare many wild creatures which we not only seek for recreation but depend on for existence."

Destruction: Extinctions

Abbott, Jacob Bates. Vanishing Americans, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 17(1), April 1946, pp. 6-7, 30, illus.

Popular account of extinct and threatened birds and mammals, pointing the need for more adequate conservation policies.

Destruction: By insecticides

Moody, Robert J. Effect of insecticides on game birds, Arizona Wildlife and Sportsman (Arizona Game Protective Assoc., 9 North Fifth Ave., Tucson. 15 cents a copy), 7(1), Jan. 1946, p. 11.

Probably few birds are killed by insecticides properly used. Present knowledge of the effect upon warm-blooded animals of a number of currently used poisons is briefly summarized.

Destruction: In war time

Gabrielson, Ira N. It was rugged for wildlife, too, Animal Kingdom (Zoological Park, 185th St. & Southern Blvd., New York 60, N. Y. 50 cents a copy), 49(2), March-April 1946, pp. 55-57, 88, 3 photos.

Associated with the war period were some destruction of whales in submarine hunting, some wanton shooting up of bird colonies, and scattered instances of illegal killing of game by soldiers. Oil pollution greatly increased and many thousands of sea birds were destroyed. Some fishes were killed by depth bombs; fishing was less in offshore, but greater in inshore, waters; consumption was diversified and if this continues in peace time, it will have a favorable effect on fisheries in general. Hunting was reduced in remote areas but probably increased near large centers of population. With the return of veterans, further increase in hunting may be expected. The use of refuge lands for military training is not thought to have done much harm to wildlife. Marshes were filled and water pollution increased in connection with war-time production plants. Especially on the central and southern Pacific islands where combat occurred, much wildlife was destroyed and some forms nearly or quite exterminated. "Altogether the cumulative bad effects of the war seem to me to far outweigh the temporary gains in populations . . . Much effort will be required to compensate for the destruction of water and land habitat. War seems to be bad for wildlife and fish as well as for man."

Destruction: Of whales

Hamilton, J. E. Whale stocks and whaling, Nature (St. Martin's St., London, W.C. 2, England. 1 shilling 6 pence a copy), 157(3987), March 30, 1946, p. 412.

Contrasting optimistic and pessimistic views as to the future of whaling. The author points out that under the International Agreement on Whaling the minimum lengths of killable whales "are less than the lengths at which whales become sexually mature and are therefore of little or no use for preserving the stock." A table of lengths illustrates the point for blue, fin, and humpback whales. In conclusion he says, "Having regard to the history of whaling in the past, it seems reasonably probable that the supplies are likely to diminish with perceptible rapidity, even if the results of the first season [after the war] are highly satisfactory from the point of view of the whalers."

Diseases and Parasites: Blood parasites

Wagner, Edward D. Blood parasites of the magpie and English sparrow of eastern Washington, Bird-Banding (Chas. B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 17(2), April 1946, pp. 72-74, 1 table.

One species of each of three genera, besides microfilariae, were found in the blood of magpies and microfilariae alone in that of English sparrows. Measurements and a table of incidence are given. Bibliography of 7 titles.

Diseases and Parasites: Botulism

McLean, Donald D. Duck disease at Tulare Lake, California Fish and Game (Ferry Bldg., San Francisco 11, Calif.), 32(2), April 1946, pp. 71-80, 2 figs., 5 tables.

Following a flood, conditions became favorable for increase of the botulinus bacterium; and waterfowl, chiefly ducks, became affected by botulism. Estimates of the numbers involved and records of those picked up and treated are tabulated for each of the years 1938-44. Very little sickness was noted in 1945. The percentage of loss of all birds retrieved (14,800) was 17.07. Total losses in 1938 were 15 to 20 thousand ducks; those for other years are not estimated.

Diseases and Parasites: Pasteurellosis

Queen, F. B., and E. R. Quortrup. Treatment of Pasteurella multocida (fowl cholera) infection in wild ducks with autogenous bacterin and penicillin, Journ. Amer. Vet. Med. Assoc. (600 S. Michigan Ave., Chicago 5, Ill. 75 cents a copy), 108(827), Feb. 1946, pp. 101-103, 2 tables.

See accompanying abstract by Quortrup, Queen, and Merovka. Experimentally, it was determined that: "(1) Autogenous bacterin protects wild ducks against experimental infection with Pasteurella multocida (strain 800); (2) penicillin protects wild ducks experimentally infected with P. multocida (strain 800)."

Diseases and Parasites: Pasteurellosis

Quortrup, E. R., F. B. Queen, and L. J. Merovka. An outbreak of pasteurellosis in wild ducks, Journ. Amer. Vet. Med. Assoc. (600 S. Michigan Ave., Chicago 5, Ill. 75 cents a copy), 108(827), Feb. 1946, pp. 94-100, 8 figs., 1 table.

Some 300 mallards and pintails were picked up dead at a small lake in Castro County, Texas. Lesions of autopsied specimens are described and illustrated. The causative organism was identified as a strain of the fowl cholera bacterium, Pasteurella multocida. Laboratory studies of its appearance and culture phenomena, biochemistry, and pathogenicity are reported upon. Bibliography of 8 titles.

Diseases and Parasites: Ulcerative enteritis

Churchill, Helen M., and Don R. Coburn. Sulfonamide drugs in the treatment of ulcerative enteritis of quail, Veterinary Medicine (7632 Crandon Ave., Chicago 49, Ill. 50 cents a copy), 40(9), Sept. 1945, pp. 309-311, 2 tables.

The "quail disease" that breaks out among closely penned birds. Tests made of 3 sulfa drugs showed them "entirely ineffective in preventing development of ulcerative enteritis." Segregation of sick birds and strict attention to sanitation remain the only known methods of controlling outbreaks of the

disease. Bibliography of 9 titles.

Diseases and Parasites: Acanthocephala, Macracanthorhynchus

Rausch, Robert. New records of Macracanthorhynchus hirudinaceus in Sciuridae, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, p. 94.

Squirrels in Ohio.

Diseases and Parasites: Acarina, Ascariscus

Farner, D. S., and Elwood A. Seaman. New host records for the trombiculid mite, Ascariscus masoni Ewing, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, p. 93.

Turtle, lizard, frog, in Florida.

Diseases and Parasites: Acarina, Chatia

Brennan, James M. A new genus and species of chigger, Chatia setosa (Trombiculidae, Acarina) from northwestern United States, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(2), April 1946, pp. 132-135, 7 figs.

From red squirrel, ground squirrel, white-footed mouse, wood rat, and woodchuck, in Montana. Description, measurements, illustrations.

Diseases and Parasites: Acarina, Laelaps

Jellison, William L. A new mite, Laelaps aplodontiae, from Aplodontia, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 31(6), Dec. 1945, pp. 373-374, 1 pl.

From A. rufa (Washington, Oregon); description; illustrations; notes on other ectoparasites of the mountain beaver.

Diseases and Parasites: Acarina, Laelaptidae

Strandtmann, R. W. Atricholaelaps sigmodoni, a new species of mite parasitic on the cotton rat, and notes on the genera Atricholaelaps and Ischnolaelaps (Acarina: Laelaptidae), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(2), April 1946, pp. 164-169, 7 figs.

Description, measurements, illustrations of stages of the new form from Texas. Discussion of the characters of the two genera named. Bibliography of 5 titles.

Diseases and Parasites: Acarina, Parasitoidea

Keegan, Hugh L. Six new mites of the superfamily Parasitoidea, Trans. Amer. Microscopical Soc. (James E. Ackert, State College, Manhattan, Kans.), 65(1), Jan. 1946, pp. 69-77, 10 figs.

From pocket gopher, Kansas; common mole, Nebraska; squirrel, Iowa; king snake, Florida; and one invertebrate and one unknown host.

Diseases and Parasites: Cestoda, Andrya

Voge, Marietta. A new anoplocephalid cestode, Andrya neotomae, from the wood rat Neotoma fuscipes, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, pp. 36-39, 1 pl., 1 table.

From California; description, measurements, illustrations, comparative notes.

Diseases and Parasites: Cestoda, Diphyllobothrium

Thomas, Lyell J. New pseudophyllidean cestodes from the Great Lakes region. I. Diphyllobothrium oblongntum n. sp. from gulls, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, pp. 1-6, 1 pl.

The new species from lakes Michigan, Huron, and Nipigon is described, illustrated, and compared with related forms (infesting gulls, other fish-eating birds, and mammals), the history of which is sketched. Bibliography of 12 titles.

Diseases and Parasites: Nematoda, Dioctophyme

Dearborn, Ned. Miscellaneous notes, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, p. 178, 1 photo.

One stomach among 600 of minks distended by giant red kidney worms (D. renale).

Diseases and Parasites: Nematoda, Dracunculus

Siegler, Hilbert R. Guinea worm infestation of raccoons in New Hampshire, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, p. 179.

In two spring-caught specimens.

Diseases and Parasites: Nematoda, Longistriata

Dikmans, G. A new nematode, Longistriata caudabullata, n. sp. (Nematoda: Vianaiinae), from the short-tailed shrew, Blarina brevicauda, Proc. Helminthological Soc. of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md. 25 cents a copy), 13(1), Jan. 1946, pp. 14-16, 1 fig.

Description, measurements, illustrations, comparative notes. Maryland.

Diseases and Parasites: Nematoda, Metastrongylidae

Dougherty, Ellsworth C. The genus Aelurostrongylus Cameron, 1927 (Nematoda: Metastrongylidae), and its relatives; with descriptions of Parafilaroides, gen. nov., and Angiostrongylus gubernaculatus, sp. nov., Proc. Helminthological Soc. of Washington (Edna M. Buhrer, Plant Industry Station, Beltsville, Md. 25 cents a copy), 13(1), Jan. 1946, pp. 13-26, 2 figs.

Description of the genus is accompanied by comparative notes, a key to 6 filaroidin genera, and a synonymical catalog that includes records of hosts (mammals). The new species from a California badger is illustrated. Two-page bibliography. The author appends corrections to 7 of his earlier papers.

Diseases and Parasites: Nematoda, Metastrongylidae

Dougherty, Ellsworth C., and Frans C. Goble. The genus Protostrongylus Kamenskii, 1905 (Nematoda: Metastrongylidae), and its relatives: Preliminary note, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, pp. 7-16.

Taxonomic history of the group, key to 10 genera, synonymic list of their species and hosts (ruminants and hares); two of the genera are proposed as new. Two-page bibliography.

Diseases and Parasites: Nematoda, Obeliscoides

Rausch, Robert, and Jack Tiner. Obeliscoides cuniculi from the woodchuck in Ohio and Michigan, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 177-178, 2 photos.

Apparently a common host, degree of infestation found by the authors higher than in rabbits, long considered the only natural host.

Diseases and Parasites: Nematoda, Physaloptera

Morgan, Banner Bill. A redescription of Physaloptera limbata Leidy, 1856 (Nematoda: Physalopterinae), Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, pp. 69-71, 1 pl.

From moles; distribution, description, measurements, illustrations. Bibliography of 7 titles.

Diseases and Parasites: Nematoda, Physaloptera

Morgan, Banner Bill. The Physalopterа (Nematoda) of carnivores, Trans. Wisconsin Acad. Sciences, Arts and Letters (B. B. Morgan, 211 Genetics Bldg., University of Wisconsin, Madison. $4.00 a copy), 36, 1944, pp. 375-388, 1 pl., 2 tables. Separate issued Jan. 12, 1946.

Review of literature (3-1/2 page bibliography); critical notes, measurements, illustrations, and key to the 9 recognized species.

Diseases and Parasites: Nematoda, Syngamus

Goble, Frans C., and H. L. Kutz. Notes on the gapeworms (Nematoda: Syngamidae) of galliform and passeriform birds in New York State, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 31(6), Dec. 1945, pp. 394-400, 2 tables.

Review of pertinent literature (29 titles cited); incidence of syngamids in 2 species of Galliformes and 4 of Passeriformes of New York; size of infections and pathology; morphology and identity of the worms; characters of the genus and of 4 of its species, to which a key is given.

Diseases and Parasites: Nematoda, Trichuris

Chandler, Asa C. Trichuris peromysci n. sp. from Peromyscus californicus, and further notes on T. perognathi Chandler, 1945, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(2), April 1946, p. 208.

Description, measurements of the new species from California; supplementary description of the second species.

Diseases and Parasites: Trematoda, Alaria

Swanson, Gustav, and Arnold B. Erickson. Alaria taxideae n. sp., from the badger and other mustelids, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 33(1), Feb. 1946, pp. 17-19, 1 pl.

From Minnesota; description, measurements, illustrations.

Diseases and Parasites: Trematoda, Microphallus

Rausch, Robert. New host records for Microphallus ovatus Osborn, 1919, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(1), Feb. 1946, pp. 93-94.

Three species of turtles from Ohio; descriptive and biological notes; previous records were from fishes.

Diseases and Parasites: Trematoda, Microphallus

Rausch, Robert. The raccoon, a new host for Microphallus sp., with additional notes on M. ovatus from turtles, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 32(2), April 1946, pp. 208-209.

No North American species of the genus has previously been reported from a warm-blooded host and the status of the Ohio specimens reported is recorded as indefinite. Description, measurements, and comparative notes are given.

Diseases and Parasites: Trematoda, Prosthodendrium

Manter, H. W., and Jeannette S. Debus. Two trematodes from a hibernating bat, Myotis californicus, Trans. Amer. Microscopical Soc. (James E. Ackert, State College, Manhattan, Kans.), 64(4), Oct. 1945, pp. 297-299, 1 fig.

Nebraska, one new: Prosthodendrium oligolecithum, description, measurements, illustration, comparative notes. Bibliography of 6 titles.

Diseases and Parasites: Of big game

Rush, William. When animals get sick, American Forests (919 Seventeenth St., N. W., Washington 6, D. C. 35 cents a copy), 52(1), Jan. 1946, pp. 24-26, 48, 2 figs., 1 cartoon.

Popular account, embodying field observations of the writer and acquaintances on abnormal behavior of big game together in most instances with notes on autopsies revealing the probable cause.

Diseases and Parasites: Of Russian olive

Miller, Harold W. A new disease of Russian olive in the Pacific Northwest, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 50 cents a copy), 44(2), Feb. 1946, pp. 118-120.

A disease is described but not identified which kills Russian olive in the region indicated. The discovery is of interest to wildlife managers as this plant, widely used for shelter belt, windbreak, and ornamental planting, is of considerable value as a food resource, especially for birds.

Diseases and Parasites: Of skunks

Tiner, Jack D. Some helminth parasites of skunks in Texas, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(1), Feb. 1946, pp. 82-83, 1 table.

Author's summary: "Six kinds of parasites were recovered from stomachs and intestines of about 170 skunks of three genera collected in Texas. So far as could be determined, Molineus sp. is previously unreported in skunks. Filaria martis is reported for the first time from Conepatus mesoleucus and Mephitis mephitis. Physaloptera maxillaris has not been reported previously in Spilogale leucoparia."

Diseases and Parasites: Of swan, trumpeter

Cowan, I. McT. Death of a trumpeter swan from multiple parasitism, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(2), April 1946, pp. 248-249.

Report on autopsy of a bird taken in British Columbia that was heavily parasitized by tapeworms, flukes, and roundworms; another specimen had the white swan-louse abundant in its plumage; scientific names are given, so far as possible; the tapeworm was Hymenolepis, apparently of an undescribed species.

Ecology: Birds vs. insects

Rice, Lucile A. Studies on deciduous forest animal populations during a two-year period with differences in rainfall, Amer. Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 35(1), Jan. 1946, pp. 153-192, 4 figs., 8 tables.

This paper reports chiefly upon invertebrates but discusses their relation to other organisms. A table summarizes the seasonal feeding of 15 species of birds upon insects of the principal orders. The number of insects consumed by nesting birds and their young is estimated (3,442,480 in 60 days on 50 acres). The effect of bird feeding on insects at other seasons is discussed; in 1935, robins took five-sixths of the hibernating insects on 25 acres. The number of birds is greatest in fall when insects were moving both in and out of the woods to wintering quarters. Bibliography of 13 titles.

Ecology: Cedar, White

Curtis, James D. Preliminary observations on northern white cedar in Maine, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 27(1), Jan. 1946, pp. 23-36, 5 figs., 1 table.

Rodents, including the red-backed mouse, are responsible for seedling losses through cutting the plantlets from their runways. Cedar browse is staple diet for deer, and various parts of the plant are fed upon also by porcupines, snowshoe hares, and red squirrels; the trees are used as nesting and feeding sites by various birds. Bibliography of 11 titles.

Ecology: Gulls vs. terns

Crowell, Ethel M., and Sears Crowell. The displacement of terns by herring gulls at the Weepecket Islands, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 17(1), Jan. 1946, pp. 1-10, 3 tables.

Authors' summary: "(1) The changes in population at the colony of Common and Roseate Terns at Weepecket Island, Mass., . . . [are] described for a period of twenty years; (2) during the past ten years this colony of 3500 terns has been replaced by breeding Herring Gulls; (3) in only one season was there evidence that the gulls were seriously predatory on the terns; (4) the terns are probably incapable of successful reproductive activity if gulls are near, even though the latter do no direct injury; (5) the members of the colony have been redistributed to other colonies of southern Massachusetts as shown by recoveries of banded birds; (6) conditions favor a recolonization by the terns if the gulls are evicted or abandon the islands." Bibliography of 12 titles.

Ecology: Pheasant, quail, fox

Buss, Irven O. Pheasants, fox, and quail, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison 2), 11(4), April 1946, pp. 8-15, 4 figs., tables.

Decrease in the pheasant bag was attributed to fox depredations by some hunters. A similar charge in Michigan was refuted by Durward Allen (see WILDLIFE REVIEW, No. 45, Feb. 1946, p. 16) whose paper is reviewed. During the present author's investigation in Dunn County, Wisconsin, examination of 28 stomachs of red and gray foxes revealed no direct predation on either the pheasant or quail. The numbers and acres per individual of these three (the 2 foxes as one) animals are tabulated. While the pheasant population was low, that of the bobwhite was high--a good indication that predation was not a ruling factor. The phenology and life history of the birds are compared in an attempt to elucidate the cause of the differences in population. Low temperature during the breeding season may have had an inhibiting effect upon the pheasants. Information is given on sex and age classes, and weights of bobwhites. Bibliography of 9 titles.

Ecology: Pigmy conifers

Hardy, Ross. Breeding birds of the pigmy conifers in the Book Cliff region of eastern Utah, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 62(4), Oct. 1945, pp. 523-542, 2 pls.

Sketch of ecological conditions of the study area, their limiting influences on the bird population, and discussion of the birds resident and transient in the juniper-pinon association and their adaptations.

Ecology: Pinon

Miller, Alden H. Vertebrate inhabitants of the pinon association in the Death Valley region, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 27(1), Jan. 1946, pp. 54-60.

Occurrence of numerous birds and mammals and notes on the habits of some of them. Bibliography of 7 titles.

Ecology: Pocket gopher in relation to erosion

Ellison, Lincoln. The pocket gopher in relation to soil erosion on mountain range, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 27(2), April 1946, pp. 101-114, 6 figs., 3 tables.

Report on an investigation on the Wasatch Plateau in central Utah. The study area is described and results discussed as to the amount of soil displaced by gophers and the relation of this displacement to erosion. From author's summary: "No evidence has been found on the Wasatch Plateau that tunnels of pocket gophers concentrate overland flow in a degree to create gullies,

unless, possibly, abnormal surficial runoff is induced by other causes. Delayed infiltration, the cause of gully-cutting runoff, cannot be attributed to pocket-gopher activities. On the contrary, loosening of soil and formation of minor irregularities on the soil surface by pocket gophers no doubt increase rapidity of infiltration. No evidence has been found on the Wasatch Plateau that pocket gophers destroy vegetation to a sufficient degree to cause accelerated erosion. Pocket-gopher diggings provide a surface for establishment of vegetation that is less favorable than an undisturbed soil surface with a vegetal cover, but apparently more favorable than a severely eroded surface. They seem to be instrumental in bringing about revegetation of some erosion-pavement areas. The pocket gopher is an agent both in geologic normal and in accelerated erosion. He is not, however, the primary cause of accelerated erosion on the Wasatch Plateau. There the primary cause of accelerated erosion is overgrazing. The amount of accelerated soil loss resulting from pocket-gopher activity is related to the degree to which the soil mantle is dissected and the soil surface bared by man's abuse of the land." Bibliography of 16 titles.

Ecology: Populations, bird

Hickey, Margaret B. Ninth breeding-bird census, Audubon Magazine (1006 Fifth Ave., New York 28, N. Y. 25 cents a copy), 47(6), Nov. 1945, Section 2, pp. 57-67, tables.

Report on 24 areas in 13 states and provinces; one of the tracts has been observed continuously for 13 years, one for 9 years, and 5 for 8 years. The comparative records should have considerable value to the general student of bird populations. The study areas are described and the results given in text and tables.

Ecology: Shelterbelts

Munns, E. N., and Joseph H. Stoeckeler. How are the Great Plains shelterbelts?, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 50 cents a copy), 44(4), April 1946, pp. 237-257, 7 figs., 4 tables.

Details of survival and growth of these plantings, so much publicized, 1934-1943, are recorded. Tree survival throughout was generally good. Rodent and rabbit damage is noted and the value of the belts as havens for pheasants, doves, songbirds, and other wildlife is set forth. Greater success than at first deemed possible has been attained but the shelterbelts need conservation and good management.

Ecology: Soil fertility in relation to game food plants

Wilde, S. A. Soil-fertility standards for game food plants, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 77-81, 3 tables.

Report on analyses of samples of Wisconsin soil where woody plants of 7 species were growing vigorously and fruiting. Significant factors are tabulated and the findings converted into standards of soil fertility for nurseries

rearing game food plants and of site requirements for the plants. Exceptional cases are discussed and the importance of properly fertile sites to the plants and in relation to their nutritive value to wildlife is emphasized. The deficiencies of exclusive timber crop forestry are pointed out. Bibliography of 5 titles.

Ecology: Tundra

Palmer, Lawrence J., and Charles H. Rouse. Study of Alaska tundra with reference to its reactions to reindeer and other grazing. U. S. Fish and Wildlife Service Research Rep. 10 (Supt. of Documents, Washington 25, D. C. 25 cents a copy), 48 pp., 20 figs., 1945.

Nature of the cover and list of principal plants of the tundra and reports on widely distributed quadrats, so treated as to simulate grazing of varying intensity, and on check plots, through series (up to 14) of years. The results are summarized and suggestions are made as to grazing management of the different vegetative types.

Ecology: Woodland birds

Taylor, W. L. Ornithology and forest insect pests, Forestry (Soc. of Foresters of Great Britain, London, Eng.), 18 (1944), pp. 1-11, 1 illus.

The need is stressed for further scientific investigation into the ways of birds in woodlands and their numbers and distribution, what they eat, and how they can be attracted. Following a general discussion along these lines, the author presents a progress report on a project having as its objects the attraction of more insect-feeding birds to a hardwood forest by providing artificially constructed nesting boxes and to ascertain the effects an increased bird population might have on the periodic outbreaks of defoliating insects common in this and many other English oakwoods. Thus far the experiment shows that an efficient type of nesting box has been devised (described and illustrated), and that it is possible to establish a population of nesting birds of the order of two families per acre in this type of woodland. A bird census and lists of insects identified are included. (From Experiment Station Record).

Economics: Muskrat

Chatterton, H. J. The muskrat fur industry of Louisiana, Journ. Geog. (A. J. Nystrom and Co., 3333 Elston Ave., Chicago, Ill. 35 cents a copy), 43(5), May 1944, pp. 185-195, 5 figs.

This general account of the muskrat as a fur animal includes maps showing its distribution in North America and in Louisiana, its habits, muskrat houses, its enemies, trapping, and conservation and its status in the State in furnishing fur and a substitute source of musk for the perfume trade. "From present indications, it seems fair to predict that the marshlands of south Louisiana will continue to be used for the production of muskrat furs . . . It would be difficult to find a more profitable use of the extensive and almost

uninhabitable marshlands along the Gulf Coast of Louisiana," where it is said to form a distinct species--Ondatra zibethicus rivalicius. (From Experiment Station Record.)

Education: Arbor and Wild life day

Authors. Arbor and wild life day, University of the State of New York (Albany), Bulletin to the Schools, 32(7), March 1946, pp. 173-204, illus.

Contains the following among other articles: H. George Murphy on "Arbor and Wild Life Day in Elementary Schools," suggesting activities, studies, and collateral reading (with bibliography of 11 titles); Ward C. Bowen, "Visual Aids in Nature Study," on the use of illustrations, books, and motion pictures, recommending "Study nature and books--and use visual aids"; W. J. Schoonmaker, "Rare and Extinct Birds," with special reference to species known from New York; and Lillian C. Stoner, "The Barn Owl," in reference to its life history and food habits.

Education: Birds of Tennessee

Craig, John L. Birds of Tennessee in verse and story. State Dept. of Conservation (Nashville, Tenn.), 76 pp., 3 pls., 2 photos, 1 chart, and 30 separate small colored pictures of birds. 1939, reprinted 1940, 1944, 1945.

General remarks refer to: Birds that have increased, those that are rare, and those extinct; the value of birds and their protection; and habits, migration, and flight speed of birds. Each of 25 species has a two-page entry, where space is provided to paste a colored picture, and matter descriptive of the appearance, habits, and status of each is given, together with two 4-line stanzas of verse about the bird. At the end of the book are suggestions for attracting birds and a blank chart for recording the presence of 25 species.

Education: Conservation

Seagears, Clayton B. The story of conservation in New York, Cornell Rural School Leaflet (New York State College of Agriculture, Cornell University, Ithaca), 39(4), March 1946, 32 pp.

In reproduction of script and hand printing, with numerous cartoons, this leaflet carries the conservation message to the school children of New York. The coverage is general but wildlife receives due attention. An ingenious and praiseworthy contribution.

Education: Deer of North America

Goodwin, George G. Hoofed animals of North America. Part I--Animals with antlers--the deer, School Nature League Bulletin (National Audubon Soc., 1000 Fifth Ave., New York 28, N. Y. 10 cents a copy), 16(9), May 1946, 4 pp., 7 figs.

Semipopular account by an authority who has succeeded in mentioning in brief compass the most characteristic features and habits of the animals treated.

Education: Ornithology

Pettingill, Olin S., Jr. A laboratory and field manual of ornithology, 248 pp (processed), amply illustrated chiefly by Walter J. Breckenridge. (Burgess Publishing Co., 426 South Sixth St., Minneapolis 15, Minn. $3.50 a copy.)

A manual developed during teaching experience, of which this is the third revision. It is for college students and includes 18 sections, each with an outline of basic information, directions for making detailed observational studies, and references to pertinent reading. Subjects treated include: bird topography, feathers and feather tracts, internal anatomy, classification and nomenclature, external characters, and laboratory identification, including keys to the orders and families of birds of the United States and Canada. There are also sections on plumages and coloration, distribution and migration, field identification, bird ecology, communities and territory, mating, nest-building, eggs and young, parental care, and populations. Appendixes relate to field methods, preparation of papers, and ornithological literature.

The work is well done, adequately illustrated, and when it attains actual book form, should take the place of Coues' time-honored "Field Ornithology." It is not so full with respect to most subjects Coues treated but doubtless is adequate for its purpose. However, it embraces numerous topics unknown to the "Field Ornithology" and its times and deals with all in the light of the most modern knowledge. To sum up: it is effectively organized and well done.

Education: Wildlife of Tennessee

Caldwell, John C., James L. Bailey, and Richard W. Watkins. Tennessee Wildlife (State Dept. of Conservation, Nashville), Educational Service Bul. 4, 32 pp., illus. (13 and cover cut col.), 1938, 1940, and later printings.

Accounts, with colored pictures, of the wild turkey, ruffed grouse, and bobwhite as well as of 13 species of game and fur mammals. Destruction of wildlife in the State is recapitulated and the status of 7 extinct or rare mammals set forth in a table. A chronology of conservation in Tennessee is given with explanatory remarks. Adverse influences are discussed and helpful procedures recommended. The State's wildlife program is explained. Unprotected species, migratory waterfowl, hawks and other predators, and the value of wildlife also are discussed.

Food Habits: Birds vs. Elateridae

Knowlton, George F. Elateridae eaten by Utah birds, Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 38(6), Dec. 1945, p. 707, 1 table.

Of 2,018 stomachs of 29 species, 101 contained Elateridae (click beetles, wireworms); the data are tabulated and commented upon.

Food Habits: Utilization of grit by bobwhite

Nestler, Ralph B. Mechanical value of grit for bobwhite quail, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 137-142, 1 pl., tables.

Author's summary: "An investigation on the need of grit as a grinding agent in the digestive processes of bobwhite quail was conducted with 1,372 pen-raised birds at the Patuxent Research Refuge, Bowie, Maryland. Some of the stock was reared, maintained through winter, and bred without access to any grit, although the diet after the tenth week consisted of whole seeds. As to survival, weight, and efficiency of feed consumption, the birds without grit during the period of growth equalled those with access to grit. Such birds, when continued on a gritless regimen during the winter, survived and maintained their weight as successfully as birds on grit. There were no gizzard lesions, and the digestion of whole seeds was satisfactory. Subsequent health and reproduction were unaffected by the absence of grit. The quail reared with access to grit retained an appreciable supply of grit in their gizzards for five months after being deprived of it." Bibliography of 14 titles.

Food Habits: Of armadillo

Hamilton, W. J., Jr. The black persimmon as a summer food of the Texas armadillo, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, p. 175.

Forming about 60 percent of the contents of eight stomachs examined; apparently an important seasonal (June) food.

Food Habits: Of blackbird, red-winged

Hayne, D. W. The relation between number of ears opened and the amount of grain taken by redwings in cornfields, Journ. Agr. Research (Supt. of Documents, Washington 25, D. C. 10 cents a copy), 72(8), April 15, 1946, pp. 289-295, 1 fig.

Account of the feeding habits of red-winged blackbirds, especially in cornfields. Mathematical treatment of the observations. Ears in the milk, and of greater length and diameter (i.e. the better ears), are preferred; the birds do not return to an opened ear merely because it has been opened; losses are in proportion to the number of ears attacked. Locality, Michigan.

Food Habits: Of bobcat

Smith, Bertrand E. Wildcat predation on deer, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 26(4), Nov. 1945, pp. 439-440.

Account of field observations in Maine as to bobcat predation on snowshoe hares and deer; and the method of killing deer.

Food Habits: Of bobwhite

Baldwin, W. P., Jr., and C. O. Handley. Winter food of bobwhite quail in Virginia, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 142-149, 1 fig., 3 tables.

Authors' summary: "The contents of 495 crops of the bobwhite quail (Colinus virginianus) collected throughout Virginia between November 15 and January 31 were examined. The total food comprised 98 per cent vegetable matter and two per cent animal matter. Marked variations occurred in the volume consumed from month to month and section to section for certain species and groups of food items. The native legumes were the most important source of food followed, in order of importance, by common ragweed, cultivated legumes, cultivated grains, mast, miscellaneous seeds, fruits, animal matter, forage, and native grasses. Native and cultivated legumes together made over 40 per cent of the total winter food. More than 25 per cent of the diet was drawn from cultivated crops of all kinds, and a large additional percentage resulted from agricultural practices that encouraged the growth of ragweed and Japan clover (common lespedeza) throughout the Virginia countryside." Bibliography of 6 titles.

Food Habits: Of cottontail

Sweetman, Harvey L. A supplementary note on the winter food habits of cottontail rabbits, Ecology (Prince and Lemon Sts., Lancaster, Pa. $1.50 a copy), 27(2), April 1946, pp. 185-188, table.

Original paper was abstracted in WILDLIFE REVIEW, No. 43, June 1945, p. 22. The present article summarizes observations during the winter of 1944-45 when there were deep accumulations of snow. The table records data upon 101 species of woody plants in comparison with that cited by Van Dersal from the files of the Biological Survey. "Fifty-five of the 101 species of woody plants sufficiently tender and available to the rabbits were chosen so frequently for feeding as to be extensively injured. Twenty-three species were slightly attractive and 25 species remained practically uninjured throughout both winters." Locality, Massachusetts.

Food Habits: Of deer, white-tailed

Hill, Ralph R. Palatability ratings of Black Hills plants for white-tailed deer, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(1), Jan. 1946, pp. 47-54, 1 fig., 2 tables.

Description of the area and of study procedures; tabulation of food available and eaten by the deer 1941-42; graph showing changes in diet by months; and table of palatability groupings of foods by seasons. Author's

summary: "Stomach samples of 519 white-tailed deer killed in the northern Black Hills from 1941 to 1944 were analyzed and the percentages of the plant species comprising the diet were compared with percentages available as shown by range analyses. The ratio of utilization to availability has been used to express the palatability ratings. Seasonal preferences varied greatly, necessitating the selection of key species to fit the period concerned. The winter of 1943-44 was unusually severe and many deer died of malnutrition. Since the deer did not thrive on plants of low palatability and made no use of unpalatable plants, it was concluded that unpalatable plants should be given no weight and those of low palatability little if any weight in calculating range carrying capacity.

Food Habits: Of duck, black

Addy, C. E. Food habits of the black duck on the Essex County salt marshes, Bul. Mass. Audubon Soc. (155 Newbury St., Boston 16, Mass. 20 cents a copy), 30(1), Feb. 1946, pp. 3-10, 5 figs.

Migrations of the species in the area cited, feeding habits, available foods, and their utilization. Probably "through experimentation and management relatively unproductive stretches of marshland can be made to produce an abundance of desirable black duck foods."

Food Habits: Of eagle, golden

Truman, Harry Vern. What a golden eaglet eats, Audubon Magazine (National Audubon Soc., 1006 Fifth Ave., New York 28, N. Y. 35 cents a copy), 48(1), Jan.-Feb. 1946, pp. 21-26, illus.

Notes on food brought to an eaglet in northern Montana: snakes, ground squirrels, rabbits, grouse.

Food Habits: Of flocking birds

Mcatee, W. L. The economic status of flocking birds, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 48(1), Jan.-Feb. 1946, pp. 29-31.

The special economics of flocking birds result from there being too many of one kind (or type) in a restricted locality. When damage is done, control measures should be local and reasonable so as to preserve as many of the birds as practicable for the sake of their beneficial services at other times and places. Examples of both harmful and useful activities of flocking birds are given.

Food Habits: Of goldfinch, Lawrence's

Culbertson, A. E. Lawrence goldfinches feed on jumping galls, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 48(1), Jan.-Feb. 1946, p. 40.

The gall of Quercus lobata caused by Neuroterus saltatorius. Examination of droppings disclosed only gall "hulls", suggesting that the diet of the birds for the time was exclusively of these outgrowths.

Food Habits: Of hawk, Swainson's

Taylor, Walter P. Swainson hawks working on grasshoppers again, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 48(2), March-April 1946, p. 95.

Field observations in Texas.

Food Habits: Of marten

Marshall, William H. Winter food habits of the pine marten in Montana, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(1), Feb. 1946, pp. 83-84, 1 table.

Report upon field observations and analyses of scats. The "data reaffirm the statements of many authors concerning the importance of the red squirrel in the marten's diet. They also indicate that flying squirrel, red-backed mouse and snowshoe hare--three other small mammals of northern forests--are of considerable importance at least during the winter period. Bird life was of minor value. The deer hair was undoubtedly carrion as may well have been the case with the song birds. The occurrence of lichen, which made up the bulk of one scat, and of grass, which was appreciable in three scats, indicates a casual use of these items."

Food Habits: Of salamander, brown

Barbour, Roger W., and L. Y. Lancaster. Food habits of Desmognathus fuscus in Kentucky, Copeia (Museum of Zoology, University of Michigan, Ann Arbor. $1.00 a copy), 1946(1), April, pp. 48-49, 1 table.

Tabulation of the occurrence of food items in 53 stomachs; indiscriminacy is indicated by the average small number of records for a considerable variety of prey.

Food Habits: Of squirrel, fox

Bugbee, Robert E., and Andrew Riegel. Seasonal food choices of the fox squirrel in western Kansas, Trans. Kansas Acad. Sci. (Robert Taft, University of Kansas, Lawrence), 48(2), Sept. 1945, pp. 199-203, 4 figs.

Seasonal record of field observations with discussion of the economic bearing of the squirrel's feeding habits.

Food Habits: Of vulture, black

Sprunt, Alexander, Jr. Predation on living prey by the black vulture, Auk (Frederick C. Lincoln, Fish and Wildlife Service, Dept. of the Interior, Washington 25, D. C. $1.00 a copy), 63(2), April 1946, pp. 260-261.

Although the black vulture has repeatedly been accused of attacking living animals, actual records are hard to find. A correspondent is quoted as to predation upon lambs in West Virginia. Some of the literature also is reviewed.

History: Bobwhites in Wisconsin

Schorger, A. W. The quail in early Wisconsin, Trans. Wisconsin Acad. Sciences, Arts and Letters (B. B. Morgan, 211 Genetics Bldg., University of Wisconsin, Madison. $4.00 a copy), 36, 1944, pp. 77-103, 2 figs. Separate issued Jan. 12, 1946.

"The name bob-white, used by scientists has not gained headway with the masses who are the final arbiters in terminology." The original range of the bird in this State is discussed and mapped; its period of abundance (1845-1854) apparently was a result of a decade of favorable winters; a decline in population brought about by commercial exploitation and adverse weather was noticed in 1857, great abundance was never reattained, and numbers have remained relatively stationary since 1870; irruptions of quail in Wisconsin and elsewhere are discussed, as are the effects upon population of agriculture, introductions, and weather. Severe winter killing, noted as early as 1782, has been observed at intervals ever since; this refutes the idea that northern stock succumbs to cold because of the introduction of Mexican blood. Conclusion: "There is no prospect that quail will become numerous in Wisconsin in the near future. The effects of weather are largely beyond management. Cover continues to deteriorate. Where it is not removed deliberately, its effectiveness is reduced greatly by grazing. Dairying and the raising of stock are injurious to both cover and the food supply. It is evident, therefore, that the improvement of present conditions for quail is for the most part not subject to control." References to literature cited number 171. Another of the scholarly papers on wildlife subjects by this author, for the writing of which he has prepared by many years of bibliographical research.

Introduction: Thrush, Spectacled

Isenberg, A. H., and T. F. M. Williamson. The spectacled jay-thrush at liberty in California, Avicultural Magazine (Stephen Austin & Sons, 1 Fore St., Hertford, England. 5 shillings a copy), 52(2), March-April 1946, pp. 48-50.

Trochalopterum canorum of the family Timaliidae from China. The bird has been colonized in Hawaii and some were brought to California "with the idea of liberating them." Young have been reared every year since 1941 at Woodside and the authors regard the species as "well established."

It is certainly not the understanding that permits for the importation of birds should cover their liberation, and if aviculturists persist in the practice, we may have additional undesirable species colonized in this country.

Life Histories: Beaver

Bradt, G. W. Engineer of the Wilds, Michigan Conservation (Mich. Dept. of Conservation, Lansing 13), 15(3), March-April 1946, p. 4, 1 pl.

Popular account of the value of the beaver in early fur trade, decline and restoration of the animal in Michigan, weight, adaptations, habits, life history, care of its pelage, and significance of castoreum to the beaver and as exploited by man.

Life Histories: Bighorn

Packard, Fred Mallery. An ecological study of the bighorn sheep in Rocky Mountain National Park, Colorado, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(1), Feb. 1946, pp. 3-28, 1 pl., 7 tables.

Author's summary: "The ecology of the Rocky Mountain bighorn in Rocky Mountain National Park was studied from March 15, 1939, to November 15, 1940. Field observations were supplemented by laboratory analyses of soil and water, autopsies of specimens, and collection of information from other observers, including early residents of the area. Two periods of decline in numbers have occurred. The advent of white settlers caused an initial decline, due to hunting for market and sport, restriction of the lower winter range, and the introduction of scabies. Adequate protection after 1909 resulted in a recrudescence, partly an actual increase in the number of bighorns occupying the higher ranges, and partly an indirect result of the concentration of all the population on this area. A second decline became evident in 1921 and has continued until the present. This has been traced tentatively to an apparent deficiency of mineral salts in the granitic soils of the present ranges. This is suggested by the fact that at the few places in the park where such salts are available, large quantities of soil are ingested by the sheep. The mineral deficiency may be accompanied by protein deficiencies as well. The effect appears to be a reduction in the stamina of the sheep, with an increased susceptibility to internal parasites, especially lungworms and coccidia. Further debility, and possibly irritation of the bronchial membranes by lungworms, admit pneumonic bacilli, Pasteurella oviseptica and Corynebacterium pyogenes, that effect the death of the sheep from hemorrhagic septicemia. The lack of yearlings suggests that the mortality of lambs is high. Placing of mineralized salt blocks on the range is recommended. Although competition by elk has previously been suggested as a reason for the decline in sheep, this factor is not considered of great importance. It is doubtful, too, if predators have been of real significance in the decline. Sex-age records of observations of bighorns over a period of two years indicated that approximately 300 mountain sheep occupied Rocky Mountain National Park during 1939 and 1940, the sex ratio indicating that there were about twice as many ewes as rams." Bibliography of 10 titles.

Life Histories: Bobwhite

Lehmann, Valgene W. Bobwhite quail reproduction in southwestern Texas, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 111-123, 2 pls., 1 fig., 4 tables.

Abrupt variations in quail numbers are characteristic and may be due in part to greater mobility of the birds than of those in southeastern and mid-western areas reported upon by other authors. The methods of the study (including nest finding by a flushing bar mounted on a truck) are described. Results are summarized as to: Nesting season, nest locations and cover, height of grass, nest materials, construction and concealment, clutches and incubation, fate of nests (46% successful), predation, especially of the coyote, seasonal population increase, and factors regulating reproduction. The paper is well organized and conveniently summarized. Bibliography of 5 titles.

Life Histories: Bobwhite

Lehmann, Valgene W. Mobility of bobwhite quail in southwestern Texas, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 124-136, 1 pl., 3 figs., 1 table.

Review of literature recording the prevailing localization of more northern and eastern bobwhite populations and presentation of data which indicate greater mobility in Texas. A new type of trap proved superior for use under southwestern conditions. More than 2,500 birds were banded, and 787 movement records of 699 individuals were obtained. Though the maximum population of the study area was 735, a minimum of 1,659 bobwhites occurred on the range during the two-year study period. Movements are analyzed seasonally and illustrated individually. Dimensions of home ranges are discussed; they seem greater than in regions previously studied. Covey history and covey ranges are reported upon and the latter graphed. The difference in mobility of the Texas birds seems proved but is not strikingly great. Bibliography of 11 titles.

Life Histories: Goose, Canada

Elder, William H. Age and sex criteria and weights of Canada geese, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 93-111, 2 pls., 6 figs., 2 tables.

Summary of information gained chiefly at Horse Shoe Lake, Illinois. Findings of others as to weights also are discussed; the author's results (tabulated) show average weights for males to be: (young) 7.45, (mature) 8.38, and females (young) 6.53, and (mature) 7.05 pounds, respectively. Seasonal variation is tabulated and discussed; there was a significant winter loss in weight in all sex and age groups. Recorded findings for other birds are compared. Indicators of degree of maturity are described and illustrated; they involve the plumage and primary sexual characters. Bibliography of 56 titles.

This study is notable for the thoroughness of its bibliographical, as well as of its field, investigations.

Life Histories: Ground squirrel, Mexican

Edwards, Robert L. Some notes on the life history of the Mexican ground squirrel in Texas, Journ. Mammalogy (Ermet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 105-115, 2 pls., 4 figs.

Citellus mexicanus; notes on habitat, burrows, nests, reproduction and young, food, behavior, voice, predation, and parasites.

Life Histories: Grouse

Marshall, William H. Cover preferences, seasonal movements, and food habits of Richardson's grouse and ruffed grouse in southern Idaho, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 50 cents a copy), 58(1), March 1946, pp. 42-52, 6 figs., 2 tables.

Results of 2 years' field investigations. From author's summary: "From October through March, Richardson's Grouse lived on the higher ridges, where they were dependent on scattered stands of conifers for both food and cover. In May, June, and early July, they stayed at lower elevations and ate chiefly the flowering parts of various plants. In late July and early August, broods and females were concentrated along water courses, while single birds (those identified proving to be adult males) were in the higher timber types. The food at this time consisted largely of insects, berries, fruits, and leaves of various shrubs. By mid-September the females and broods had moved to the higher ridges, where at first they continued to feed on berries and leaves of shrubs and later shifted to a diet of conifer needles and buds. Idaho Ruffed Grouse were found in the overmature ponderosa pine and Douglas fir-spruce types at middle elevations throughout the year. During the winter they fed largely on the buds of a wide variety of shrubs which grow under openings in the forest canopy. The movements of this grouse are apparently quite restricted. Both species of grouse were dependent during the entire year on coniferous trees for escape cover. The movements of the Richardson's Grouse seem to be influenced by the differing rates of plant development at different altitudes. The summer range of the Richardson's Grouse is in areas intensively used by man and livestock, but the winter range is in areas relatively unaffected by man. Although some lumbering is carried on in the range of the Ruffed Grouse, it does not seriously endanger the grouse habitat. Grouse hunting has decreased in recent years. Brood counts along water courses in August furnish a dependable basis for estimates of yearly population increase. Continued improvements in range management practices on the spring and summer ranges and the use of a flexible September hunting season based on August brood counts should be adequate to build up the grouse populations of the area."

Life Histories: Opossum

Reynolds, Harold C. Some aspects of the life history and ecology of the opossum in central Missouri, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 26(4), Nov. 1945, pp. 361-379, 5 tables.

Review of literature on life history of the opossum and account of the author's findings as to breeding habits, sex ratio, food habits (through both stomach and scat analyses), denning, home range, winter activity, habitat, and parasites. Bibliography of 11 titles.

Life Histories: Pheasant

Mandell, Willet N. What do you know about ringnecks?, Illinois Conservation (Dept. of Conservation, 121 State House, Springfield, Ill.), 10(3 &4), 1945-46, pp. 10-12, 5 photos (one of the author).

Condensed account of wintering, mating, nesting, and rearing, and of the environmental requirements of the pheasant; briefer mention of parasites and diseases.

Life Histories: Pigeon, Band-tailed

Neff, Johnson A., and R. J. Niedrach. Nesting of the band-tailed pigeon in Colorado, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 48(2), March-April 1946, pp. 72-74, 1 photo.

Nesting range, habits of adults, and growth of the young.

Life Histories: Porcupine

Shadle, Albert R. Copulation in the porcupine, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 159-162, 1 pl.

Description and illustrations from captive animals. This author with two collaborators has a related article on "The sex reactions of porcupines (Erethizon d. dorsatum) before and after copulation" in the Journal of Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 116-121, with bibliography of 6 titles.

Life Histories: Rabbits

Llewellyn, Leonard M., and C. O. Handley. The cottontail rabbits of Virginia, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 26(4), Nov. 1945, pp. 379-390, 2 figs., 2 tables.

Primarily a report on a systematic and distributional study, this paper presents also information on weights, reproduction, parasites, diseases, importance in sport, and management suggestions relating to 2 species (4 subspecies) of cottontails and the swamp rabbit. Bibliography of 12 titles.

Life Histories: Shrews

Heppenstall, Caroline A. Shrews, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 17(1), April 1946, pp. 12, 29, 1 fig.

Popular account of the species known to occur in Pennsylvania, including notes on their habitat, feeding and other habits, and enemies.

Life Histories: Skunk

Allen, Durward L. Skunks won't stay down, Michigan Conservation (Dept. of Conservation, State Office Bldg., Lansing 13, Mich.); 15(2), Feb. 1946, pp. 3-4, 4 figs.

Safe ways of handling skunks; fluctuations in their numbers (possible cause encephalitis); skunks sluggish but not torpid in winter; breeding and feeding habits.

Life Histories: Wolverine

Abbot, Jacob Bates. Atomic power in fur, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(10), Jan. 1946, pp. 3, 20-21, 4 figs.

Wolverine: vernacular names, weight, color, distribution, number of skins taken and their value, habits, prowess, young, folklore; bibliography of fictional and factual accounts.

Life Histories: Woodchuck

Bradt, G. W. The woodchuck--professional excavator, Michigan Conservation (Dept. of Conservation, State Office Bldg., Lansing 13), 15(5), June 1946, pp. 6-7, 1 pl.

Brief life history, with emphasis on burrowing and the value of the dens in providing shelter for cottontails. Degree of protection afforded the animals.

Management: Attracting birds

Saxton, Ina M. [Winter water dish.] Audubon Magazine (National Audubon Soc., 1006 Fifth Ave., New York 28, N. Y. 35 cents a copy), 48(1), Jan.-Feb. 1946, p. 62, illus.

Description and figures of a device employing a 15- or 25-watt electric light bulb to prevent water from freezing.

Management: Beaver

Hensley, Arthur L. A progress report on beaver management in California, California Fish and Game (Ferry Bldg., San Francisco 11), 32(2), April 1946, pp. 87-99, 7 figs., 1 table.

The history of fur exploitation and legislation affecting beavers in California is reviewed and investigations and transplanting experiments are reported upon. Management problems are discussed. With a good plan and caution, the author believes that a management program beneficial to all concerned can be worked out in the State.

Management: Burning

Jenkins, B. C. What about controlled burning?, Michigan Conservation (Dept. of Conservation, State Office Bldg., Lansing 13), 15(4), May 1946, pp. 12-14, 2 photos.

Unrestricted fires following logging in Michigan destroyed wildlife habitat. Then with adequate protection from fire, conditions improved for a period, yet declined again when cover became too dense. Sporadic fires resulted in improved deer hunting, so intentional burning was tried. The results of experimental burning are discussed by habitats and the paper summarized as follows: "Controlled burning should not be looked upon as a dangerous experiment. Hundreds of accidental fires in different kinds of cover and in hazardous weather conditions are controlled every year by men without the advantage of warning or previous ground preparation. Certainly these same men can control fire on an area when it is adequately fire-lined beforehand and the fire set at their own discretion according to weather conditions. Neither should controlled burning be looked upon as an agency with strange powers to perform mysterious transformations. It does promise to be an economical means of controlling the size and density of natural growth already established. If the use of this tool merely succeeds in the maintenance of the openings we now have, the controlled burning program would have to be considered moderately successful."

Management: Burning

Lemon, Paul C. Prescribed burning in relation to grazing in the longleaf-slash pine type, Journ. Forestry (825 Mills Bldg., Washington 6, D. C. 50 cents a copy), 44(2), Feb. 1946, pp. 115-117, 1 table.

"The attitude which now appears to be coming into wider acceptance is that fire has a legitimate place in these forest types but that it must be properly used." Studies at the Alapaha Experimental Range in the Georgia Coastal Plain are reported upon and directions are given for "prescribed" burning. This operation improves forage and results in better cattle gains and may also be beneficial in fire-hazard reduction, in seedbed preparation, and for brown spot control. Bibliography of 9 titles.

Readers who have followed the abstracts on this topic from the first

issue of WILDLIFE REVIEW, September 1935, will recognize that the foresters have slowly come to agree with the findings on this subject of S. W. Greene of the Coastal Plain Experiment Station, McNeil, Mississippi, and of Herbert L. Stoddard, Dean of Wildlife Managers, as a result of his experience with the Cooperative Quail Investigation and the Cooperative Quail Study Association in the Thomasville, Georgia-Tallahassee, Florida region. Laymen had long known that burning improved grazing in the long-leaf pine woodlands, but they were often careless in its application. Improvement in knowledge has been in that direction but the basic principle has not been altered. Often it seems scientists must learn by arduous effort what the layman knows from practical experience.

Management: Cottontail

Leedy, Daniel L., and George E. Laycock. Management of Ohio cottontails, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 10(6), June 1946, pp. 12-13, 15 figs.

Brief statement on life history, food habits, and relation to tularemia. Fourteen numbered paragraphs of management suggestions (accompanied by illustrations).

Management: Deer, White-tailed

Swift, Ernest. A history of Wisconsin deer, Wisconsin Conservation Dept. (Madison) Publ. 323, March 1945, 96 pp., amply illus., covers in color.

Early publications bearing on the deer populations and their habitat are reviewed. Changes in ecological conditions caused by logging and burning are discussed and opinions of old-timers on the deer situation are summarized. Factors reducing the numbers of the animals and subsequent steps to increase them are set forth. Depletion of the food supply by a constantly growing herd is fully discussed, information being presented on the feeding habits of the animals under both favorable and unfavorable conditions. Starvation and winter feeding are exhaustively treated; a map shows the location and status of the known deer yards. The relations of deer to agriculture are considered and information is presented on damage payments, which have been rapidly increasing since 1933-34 (from two, to twenty-one, thousand dollars). Deer-forest relationships are outlined and suggestions are made for maintaining a reasonably large herd and extensive and productive forests. The terminal chapter summarizes the publication and deals with future management of the deer. Bibliography of 19 titles and list of other literature cited.

Management: Elk

Anon. Restoring the wapiti, Wyoming Wild Life (Wyoming Game and Fish Dept., Cheyenne), 10(3), March 1946, pp. 4-16, 8 photos, tables.

A plains animal, the elk was forced into forested areas by a combination of restrictive factors, and formed strongly migratory habits in going from the

untenable summer range to areas favorable for winter survival. Along migration routes, great slaughter took place and on the winter ranges, crowding and competition led to high losses. The history of refuge establishment and of feeding the animals is recounted. The table shows the numbers fed and lost in Jackson Hole, 1916-1945. Feeding is expensive, is accompanied by direct unfavorable results among the animals, and as a system, limits their increase and spread. The Wyoming Game and Fish Commission, by transplanting elk, is trying to reestablish old-time desert winter range so that a larger population can be supported in the State. The eggs would not then all be in one basket; in other words, the elk would be protected against catastrophe by having two distinct winter ranges.

Management: Elk

Murie, Olaus J. Jackson Hole Monument and the elk, National Parks Magazine (1214 Sixteenth St., N. W., Washington 6, D. C.), No. 83, Oct.-Dec. 1945, pp. 13-17, 2 photos.

Although the National Elk Refuge has long been in existence and winter feeding has been done, browse resources have been slowly disappearing because of excessive elk populations. The winter range available in Jackson Hole can not support as many animals as formerly. To avoid feeding of hay entirely we would have to cut the herd to a fraction of what it is. This winter feeding, moreover, is objectionable, directly causing average losses of 10 percent of the animals. Herd reduction, a desirable management measure, is opposed by sections of the public, and satisfactory management has not yet been achieved. The author makes suggestions, involving present and prospective resources of the Monument.

Management: Forest management in relation to wildlife management

Gordon, Seth. The forester's stake in game management, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(12), March 1946, pp. 2-5, 22-25, 30, 9 photos.

Forest management should be on the multiple use principle and wildlife should be taken into consideration whether "good or bad, economically valuable, or of interest only in an esthetic way." Forestry education includes more on wildlife management than ever before and should be concerned with recreational, as well as with direct, values of wildlife. The author reviews experience of the Pennsylvania Game Commission in managing forest areas as refuges and as State game lands together with the criticisms met and overcome, results achieved, and problems that remain.

Management: Forest wildlife

Herbert, Paul A. Wildlife and forests, Wisconsin Conservation Bul. (Wisconsin Conservation Dept., Madison 2), 11(2), Feb. 1946, pp. 14-17.

In virgin forests, undergrowth, the most important food and cover for wildlife, was sparse and the animals dependent upon it, therefore, were rela-

tively scarce. Early logging, followed by fire, and increase in hunting reduced wildlife, but second growth and greater protection have increased it again so that in general it has been more abundant, 1930-1945, than under primeval conditions. The author believes closing of the forest canopy is again reducing wildlife but that forest management can be so directed as to counteract this effect and double, even treble, the annual harvest. Suggestions are made as to how this may be accomplished.

Management: Inventory by aerial census

Morse, Marius A. Censusing big game from the air, Conservation Volunteer (Minnesota Dept. of Conservation, State Office Bldg., St. Paul), 9(52), May-June 1946, pp. 29-33, 2 pls.

The history of drive and roadside sampling methods of censusing deer in Minnesota is reviewed and the experience with 5 aerial counts in key areas is summarized. Methods and results are described. Aerial census is accurate, time-saving, and economical. The average cost per square mile to date has been $1.09.

Management: Inventory, bobwhite

Schwall, Eugene. The quail problem, Ohio Conservation Bul. (1106 State Office Bldg., Columbus 15, Ohio. 10 cents a copy), 10(4), April 1946, pp. 18-19, 1 fig.

Report upon a study of quail population in which number of coveys and average covey-size are emphasized. Mortality also is traced and its causes discussed. Field observations on the value of foods and coverts are summarized. At present the quail population is low over most of Ohio.

Management: Overpopulations

Mann, Walter G. What has happened to Kaibab deer?, Arizona Wildlife and Sportsman (Arizona Game Protective Assoc., 9 North Fifth Ave., Tucson. 15 cents a copy), 7(1), Jan. 1946, pp. 10, 11, 12.

Discussing the Kaibab overpopulation, it is implied that destruction of predators caused it. At the same time that hunting was employed to reduce the excess population, heavy winter losses also occurred, and the number of deer has steadily declined. Feed has been restored, some of it growing to a height too great for deer to utilize. There will never be a big herd again unless the killing of does is stopped. Despite lowered numbers of deer, predator control has continued. Present hunting privileges are based on overestimates of the deer population.

Management: Pond

Terres, John K. Waldens for everyone, Audubon Magazine (National Audubon Soc., 1006 Fifth Ave., New York 28, N. Y. 35 cents a copy), 48(2), March-April 1946, pp. 68-76, 11 photos.

This popular article on farm ponds tells what wildlife may be attracted and how it may be done.

Management: Quail, Valley

Emlen, John T., Jr., and Ben Glading. Increasing valley quail in California, California Agr. Expt. Sta. (Berkeley) Bul. 695, 56 pp., 29 figs. + cover cut, 4 tables, 1945.

"Valley quail are sedentary and their management is a problem comparable in many respects to the management of an agricultural crop. The program involves three steps: (1) establishing a breeding stock, (2) aiding and protecting this stock during its development, and (3) harvesting the surplus. Establishing a breeding stock is seldom difficult in California; if the area is at all suitable, there are usually at least a few quail present. Given a small population as seed stock and an adequate tract of land, nature can produce a bountiful supply of new quail every summer. The nurture and care of this stock constitute the second or cultural step. This calls for two lines of action: first, the provision of living space or habitat attractive and adequate for the special life requirements of quail; second, protection against enemies, accidents, and overshooting." Basic information and management suggestions are presented under the heads: Establishing a population, improving land for quail occupancy (food, cover, water), protecting quail populations (including recognition and control of predators), and harvesting the quail crop. There is an illustrated note on age recognition, a section on farmer-sportsman relationships, and a bibliography of 24 titles. A well arranged, succinctly written, and effectively illustrated publication. In part a cooperative wildlife research project.

Management: Range

Stoddart, L. A., and D. I. Rasmussen. Deer management and range livestock production. Utah Agr. Expt. Sta. (Logan) Circ. 121, 17 pp., 9 figs. + cover cut, 2 tables, 1945.

The big game population of Utah, by body weight equivalent to 40,600 cattle or 325,000 sheep, is supported yearlong on the range. Both sportsmen and stockmen are concerned over possible competition of the two groups of animals. Overstocking by either should be avoided as it results in impaired production and decreases the capacity of the land to produce. "Deer, unlike livestock, can neither be fed supplemental feed on the range successfully nor be moved to areas of better feed." The solution of the overpopulation problem lies in good range management and in maintaining numbers in balance with the forage supply. The bases of these conclusions are detailed in this circular which discusses factors affecting range production, livestock-deer competition, and solving the competition problem. "In summary, good deer and good livestock result from good land management. Every sportsman and stockman should strive for a better comprehension of what a good range consists of and how that range must be managed and protected if the deer herds and livestock herds are to continue to thrive. Even on areas where only livestock or only deer graze, still numbers must be limited and the herds managed on the basis of the range forage supply."

Bibliography of 9 titles. A workmanlike and authoritative publication that should be carefully studied by stockmen and hunters alike.

Management: Restocking

Aldrich, John W. Significance of racial variation in birds to wildlife management, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 86-93.

Discussion of specific, individual, and racial characteristics of birds and, in particular, the latter characters in relation to environment and survival. Races inhabiting similar though remote environments tend to be alike and successful introduced species may be considered to have been pre-adapted by long residence under essentially similar conditions. Game birds transplanted to areas too different from their native home fail to become established; examples are given. Mixture with an alien race may so alter a local population that it is no longer well adapted to its environment. The effects of introducing Mexican quail especially is discussed; in general, however, these birds were absorbed by local populations without much change. So long as native seed stock exists, it is better to work with that; when it has been extirpated, birds from as closely similar area as possible should be used for restocking. Taxonomists can aid in the solution of such problems through advice on both bird and environmental relationships. Bibliography of 11 titles.

Management: Seed, hastening germination

Johnson, L. P. V. Effect of chemical treatments on the germination of forest tree seeds, Forestry Chronicle (C. Cooper, 10 Manor Road West, Toronto, Canada), 22(1), March 1946, pp. 17-24, 3 tables.

Author's summary: "Chemical treatments were tested, in comparison with stratification and presoaking, for their effects on germination of forest tree seeds. Significant increases in percentage germination were obtained from potassium nitrate in Betula lenta, B. papyrifera, Fraxinus excelsior, Picea abies, P. glauca, P. rubens and Pinus resinosa; from thiourea in Larix decidua, Picea abies, P. glauca and P. rubens; from ethylene chlorhydrin in Betula lenta, B. papyrifera, Fraxinus excelsior, Larix decidua and Pinus resinosa; from red copper oxide in Pinus resinosa; from zinc oxide in Betula papyrifera, Picea glauca, Pinus banksiana and P. resinosa; from stratification in Acer saccharum, Betula lenta, B. lutea, B. papyrifera, B. populifolia, Fraxinus excelsior, Larix decidua, Picea glauca, Pinus resinosa and P. strobus; and from presoaking in Betula papyrifera, Larix decidua and Picea abies.

"The rate of germination was accelerated by potassium nitrate in Betula papyrifera, Picea abies, P. glauca, P. rubens and Pinus strobus; by thiourea in Betula lenta, Larix decidua, Picea glauca and P. rubens; by ethylene chlorhydrin in Larix decidua; by red copper oxide in Betula papyrifera; by stratification in practically all species; and by presoaking in Larix decidua and Picea abies. The rate of seedling growth was increased by zinc oxide in Larix, Picea, Pinus and Thuja, and by red copper oxide in Pinus."

Management: Soil conservation and wildlife conservation

Van Dersal, William R., and Edward H. Graham. The land renewed. The story of soil conservation. Oxford University Press (114 Fifth Ave., New York, N. Y. $2.00 a copy), 109 pp., 100 pls., 1946.

A popular summary of its subject matter, richly illustrated with excellent photographs. Wildlife has only one sketch to itself (Beaver Dams, p. 85) but receives incidental mention in ten places as being benefited by various soil conservation practices.

Management: Stocking pheasant

Tubbs, Farley F. Pen-reared birds don't help sport, Michigan Conservation (Dept. of Conservation, Lansing 13, Mich.), 15(3), March-April 1946, pp. 11-12, 1 fig., 3 tables.

Though the birds were established by plantings, they are now thoroughly in possession of all suitable range and, barring unforeseen calamities, it appears that the usefulness of releasing pen-reared stock is past. Data upon which these conclusions are based are presented in text and tables. The total returns on released, banded birds were 470 out of 8,485 (1935-1940) or 5.5%. The planted birds do not have as high survival as does the wild stock. The experience of shooting preserves bearing on the matter is recounted and the productive capacity of various pheasant ranges in the State is set forth. The cost of planted birds harvested is so high as to be quite uneconomical.

Management: Turkey

Wilson, Kenneth A. Wild turkey and other upland game survey and a game management study in western Maryland, Annual Report, Game and Inland Fish Commission of Maryland (512 Munsey Bldg., Baltimore 2), 1945, pp. 25-41, 1 fig., 5 tables.

Notes on the study area which includes two refuges, neither in the author's opinion, large enough; food patches were used more at other seasons than in winter for which they were prepared; notes on predators include weights of gray foxes, skunks, and opossums; winter feeding was done but apparently was not needed; food habits comment includes analyses of turkey droppings (reported by months and summarized) and notes on contents of fox stomachs; turkey census; and survival of game farm-reared birds. There is also some account of grouse management.

Management: Wildlife in Maryland

Vaughn, Ernest A. Wildlife restoration program in eastern Maryland, Annual Report, Game and Inland Fish Commission of Maryland (512 Munsey Bldg., Baltimore 2), 1945, pp. 17-25, 4 figs.

Reports on management operations on the Pocomoke State Forest (the area first set aside by the Resettlement Administration, the history of which has

been repeatedly noted in WILDLIFE REVIEW; additional notes on the bobwhite are given on pp. 42-46); Bryant's Fox Squirrel; and other wildlife demonstration areas and refuges.

Management: Winter feeding

Bowne, George T. Winter birds, Audubon Magazine (National Audubon Soc., 1006 Fifth Ave., New York 28, N. Y. 35 cents a copy), 48(1), Jan.-Feb. 1946, pp. 5-7, illus.

Descriptions and illustrations of winter feeders for small birds; food preferences of the birds and experiences in feeding them.

Natural History: Birds of Kansas

Goodrich, Arthur L., Jr. Birds in Kansas. Report of the Kansas State Board of Agriculture June 1945 (Topeka), 64(267), 340 pp., 6 col. pls., 169 figs. 1946.

Introductory chapters discuss the relations of birds and mankind, general habits of birds, faunal areas of Kansas, and the naming of birds. A selected list of the common birds is more fully annotated than is the following account of all the species in systematic arrangement. There is a list of colloquial names and schematic artificial keys to aid in identification.

Natural History: Carnivores of New Mexico

Halloran, Arthur F. The carnivores of the San Andres Mountains, New Mexico, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 154-161.

Description of the area, comment on the number of carnivores present, and notes on occurrence and habits (especially feeding) of 14 species. Bibliography of 16 titles.

Natural History: Mammals of northern Great Plains

Soper, J. Dewey. Mammals of the northern Great Plains along the international boundary in Canada, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(2), May 1946, pp. 127-153, 1 pl., 1 map.

Annotated list of species known to occur from southeastern Manitoba to the foothills of the Rocky Mountains, a territory about 875 by 60 miles in extent. Description of the area, its life zones, and mammal habitats. Summary of a great deal of information, much of it gleaned in field investigations by the author. Bibliography of 35 titles.

Natural History: Owls of Minnesota

Breckenridge, W. J. Minnesota's larger owls, Conservation Volunteer (Dept. of Conservation, State Office Bldg., St. Paul, Minn.), 9(51), March-April 1946, pp. 16-22, 2 figs.

Report on field experiences and other notes (including food habits data) concerning 4 species.

Natural History: Owls of Minnesota

[Breckenridge, Walter J.] Minnesota's smaller owls, Conservation Volunteer (Dept. of Conservation, State Office Bldg., St. Paul, Minn.), 9(52), May-June 1946, pp. 36-42, 2 figs.

Notes on habits and food of 7 species.

Natural History: Shrew venom

Lawrence, Barbara. Brief comparison of short-tailed shrew and reptile poisons, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 26(4), Nov. 1945, pp. 393-396.

Information on the constituents of snake and Gila monster venoms and their physiological effects is summarized and comparisons made with that of the short-tailed shrew. "All the evidence available on the effect of Blarina poison and of reptile venom, particularly that of the cobra, suggests very strongly that these salivary secretions resemble each other closely. Since snake venom is known to have a strong digestive action on protein, it is further suggested that Blarina saliva, in contrast to that of other mammals, may also have this property." Bibliography of 10 titles.

Propagation: Deodorizing skunks

Enders, Robert K., and Eleanor M. Paxson. Ablation of the scent glands of skunks, Journ. Amer. Vet. Med. Assoc. (600 S. Michigan Ave., Chicago 5, Ill. 75 cents a copy), 108(827) Feb. 1946, pp. 84-86, 7 figs.

Illustrated directions for deodorizing skunks.

Research: Age determination, birds

Miller, Alden H. A method of determining the age of live passerine birds, Bird-Banding (Charles B. Floyd, 210 South St., Boston, Mass. 75 cents a copy), 17(1), Jan. 1946, pp. 33-35, 1 fig.

Exposing skull which appears one-layered and pinkish in immature, but double-layered and whitish in mature, birds. The operation has no unfavorable consequences.

Research: Age determination, cottontail

Thomsen, Hans Peter, and Otto A. Mortensen. Bone growth as an age criterion in the cottontail rabbit, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 171-174, 1 pl., 1 table.

Authors' summary: "(1) Young-of-the-year can be differentiated from adult cottontails by X-ray of the bones or by staining the bones to show the presence or absence of epiphyseal cartilage; (2) this cartilage persists in the shoulder regions of some young rabbits (presumably the latest-born young) until January, and probably persists in the earliest-born young through November, during which month most rabbits are taken by hunters. Further verification is needed of the safe terminal date for age-classification by various bones." Bibliography of 9 titles.

Research: Determination of small mammal populations

Stickel, Lucille F. Experimental analysis of methods for measuring small mammal populations, Journ. Wildlife Management (P. F. English, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 10(2), April 1946, pp. 150-159, 3 figs., 3 tables.

Report on studies on the Patuxent (Md.) Research Refuge of the Fish and Wildlife Service. Author's summary: "The Peromyscus leucopus on a 17-acre study area were live-trapped, marked, and released over a seven-day period. On the three following nights intensive snap-trapping was done on the central acre of the study plot. The animals caught by snap traps in the central acre represented the population of the central acre and several surrounding acres. By the currently accepted methods of interpreting snap-trap data, the population per acre would be considered to be 23 adults. The live-trap data show that the true population was between six and seven adults per acre. Modern methods of live-trapping are shown to be valid for population studies. Two methods are presented for the conversion of live-trap data into per acre figures. Errors involved in the current use of snap-trap data are discussed and snap-trap methods are shown to be invalid for determining actual population numbers. It should be practical to use a snap-trap quadrat technique to obtain a relative measure or index figure for small mammal populations." Bibliography of 20 titles.

Research: Propagated compared to wild quail

Nestler, Ralph B., and John R. Langenbach. Propagated quail versus wild quail as studied under laboratory conditions, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 16(10), Jan. 1946, pp. 6-7, 22-23, 3 photos.

Description of the climactometer and its use; account of experiments during two years. There seemed to be some loss of alertness and wariness in pen-reared birds of captive background but little other differences.

Research: Rat control

Chitty, Dennis, and Monica Shorten. Techniques for the study of the Norway rat (Rattus norvegicus), Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(1), Feb. 1946, pp. 63-78, 2 pls., 6 figs., 5 tables.

Report on studies by the Bureau of Animal Population, Oxford University, England, of: A census baiting method, a food recording machine, and watching and marking rats. Authors' summary: "Surplus baiting with wheat has been used by the Bureau of Animal Population to census wild rat populations, especially before and after tests with poisons. For a proper interpretation of the data and also of the factors involved in poisoning, rats' feeding behavior must be understood. Automatic half-hourly records of wheat consumption have shown the predominantly nocturnal habit of well-fed rats even in a quiet environment. Where food is inadequate rats can often be conditioned to feed rapidly on token baits at any one time of day, although occasionally this response is only shown at night. It is possible to watch rats' feeding habits, behavior towards changes in the environment or the food, and other actions. There is sometimes a lengthy adjustment to certain types of change, but baited rats quickly get used to artificial illumination and can be watched by night. For short-term studies on rats, individuals can be marked by making numbers with a depilatory in their fur. It is then possible to determine total population and average individual consumption of bait. While most rats in a colony become well baited, others show peculiarities such as indifference to the bait or long absence after a single mouthful. This accounts for the survival of certain rats after poisoning." Bibliography of 10 titles.

U. S. Government: Fish and Wildlife Service, Annual Report 1944-45

Gabrielson, Ira N. Annual Report of the Director, Fish and Wildlife Service. Ann. Rep. Secretary of the Interior (Washington, D. C.) 1945, pp. 181-198.

There has been progressive shortening and "popularization" of the annual reports of government bureaus, including the Fish and Wildlife Service, so that they no longer serve to trace the history of the organizations. Instead "high lights" are emphasized and numerous activities are not mentioned at all. The subjects briefly treated in the present report include: Value of animal resources (capitalized at 140 billion dollars), effect of war on animal resources and conservation, refuges, Federal aid to state conservation agencies, effect of DDT on wildlife (studies under way), rodent and predator control, rabbit-raising, management of fur seals, the menace of pollution, effect of water utilization projects on animal resources, artificial propagation of fishes, Alaska fisheries, oyster and other marine fishery resources and utilization of their products, and value of the Fish and Wildlife Service in increasing the National wealth (30 million dollars a year).

Weights: Moose

Breckenridge, W. J. Weights of a Minnesota moose, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 27(1), Feb. 1946, pp. 90-91.

Measurements and weights of parts and all of a young bull.

Weights: Sparrow, Song

Nice, Margaret M. Weights of resident and winter visitant song sparrows in central Ohio, Condor (W. Lee Chambers, Robinson Road, Topanga, Calif. 50 cents a copy), 48(1), Jan.-Feb. 1946, pp. 40-41.

Comparison of weights of these two classes.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U S. Department of the Interior, Chicago 54, Ill.

280. Dealers in amphibians and reptiles, 3 pp., rev. November 1945.

List with addresses and indication of the classes of animals handled.

282. History and significance of American wildlife, 16 pp., May 1946.

This leaflet combines Nos. 108 and 126, by H. P. Sheldon, issued in March 1938 and February 1939, respectively. Section headings are: Original wealth in wildlife, abundance unimpaired by Indians, exploitation by white settlers, influence of wildlife on colonization and settlement, early traffic in wildlife and its products, exploitation era closing, wildlife management the remedy, a land-use problem, wildlife needs ignored during development period, awakening to the dangers which menace the resource; planning for wildlife restoration, fact-finding basis for plans, development of wildlife-protective legislation, attitude favorable to restoration as Government function, suggested reading.

283. Big-game inventory of the United States, 1943, 11 pp., February 1946.

Compilation of information from Federal agencies and from the states tabulated by states and species, and also according to land ownership. There is also a tabulation of the big game kill and a summary showing a total of some 7,000,000 head which is 5.9 percent higher than the estimate of 1941.

NOTE

The Arctic Institute of North America (805 Sherbrook St., West, Montreal, Canada) distributes pamphlets descriptive of the organization and its aims. Among them is Bulletin No. 1 (65 pp., 1946), "A program of desirable scientific investigations in arctic North America." Those in biology seem very thoroughly outlined. The Institute is offering two Research Fellowships of $1,500 each for scientific work in the American arctic and Subarctic during 1946. The research must include field investigation. Application forms may be obtained from the Institute.

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